DOCUMENT RESUME

ED 369 599 RC 019 569

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TITLE A Comparison of Traditional and Distance Education Models.
PUB DATE Mar 94
NOTE 9p.; In: Montgomery, Diane, Ed. Rural Partnerships: Working Together. Proceedings of the Annual National Conference of the American Council on Rural Special Education (ACRES) (14th, Austin, Texas, March 23-26, 1994); see RC 019 557.
PUB TYPE Speeches/Conference Papers (150) -- Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Cost Effectiveness; Degree Requirements; Delivery Systems; *Distance Education; Graduate Students; Higher Education; Masters Programs; Program Descriptions; Rural Areas; *Rural Education; *Special Education; *Teacher Certification; *Teacher Education; Teacher Shortage
IDENTIFIERS *West Virginia University

ABSTRACT

A distance education program at West Virginia University (WVU) offers graduate level training to prospective and practicing special education teachers in rural areas. This report compares the cost effectiveness of distance education to previous models at WVU during the past 15 years, including campus-based and field-based delivery systems. The Severe/Profound Handicaps program at WVU is a graduate program leading to a master's degree in special education as well as West Virginia teaching certification in severe handicaps. The program requires completion of 30 semester hours of coursework and practicum experiences for certification and an additional 6 hours of elective credits for the degree. Comparison of cost estimates across a 15-year time span indicates that although the campus-based program had the lowest combination of costs per course and per trainee, it also produced the fewest number of trainees completing the program. The field-based program achieved a reasonable balance between costs and outcomes, slightly increasing personnel and delivery costs but producing more trainees. Data from the distance education program showed a dramatic increase in costs yet a major increase in production of trainees. While the costs per course were much higher, the costs per student remained about the same. This study concludes that the costs of the distance education model were offset by the increase in the number of trainees, who are needed to meet the growing demand for special education personnel in rural areas. (Contains 19 references.) (LP)

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ED 369 599

# A COMPARISON OF TRADITIONAL AND DISTANCE EDUCATION MODELS

## Introduction

The preparation of personnel to serve students with disabilities in the nation's schools is a problem fast approaching crisis dimensions. Federal agencies and professional associations alike recently have warned of an impending major shortage in special education personnel (United States Department of Education 1988; 1989; 1990). The problem is especially severe in rural areas, where the attrition rate for special educators may be as high as 100% every three years (Bina, 1981; Helge & Marrs, 1982; Reetz, 1988). The need for teachers trained to work with students with low incidence handicaps, including those with severe/profound/multiple disabilities is particularly great. Position vacancies and numbers of uncertified personnel are consistently higher in the areas of Severe/Profound Mental Retardation or Multiple Disabilities and Early Intervention (Bricker & Filler, 1985; Marozas & May, 1988). There is an insufficient supply of newly trained personnel to meet the current and continuing demand for teachers. And, since the attrition rate due to "burnout" is high for teachers who face the variety of special challenges associated with severe disabilities (Lehr, 1990), positions are continually reopening. It is essential, therefore, for personnel preparation programs to train additional teachers to meet the continuing need for educators in this area of specialization.

Prospective and practicing, but uncertified, teachers need more accessible training programs, especially in rural areas. As the demographics of the college/university student population continues to change, personnel preparation programs must be adapted to accomodate the needs of nontraditional students, many of whom live at significant distances from the campus, and have job and family responsibilities that prevent full-time study (Rose, 1989). Distance learning models use communications technology to make college/university training programs accessible to larger numbers of students in even remote rural locations. Special education personnel prepration programs in several rural states have adopted distance learning models to train special education teachers on-the-job that use high-tech solutions such as satellite broadcasts, computer networking, and other television formats (Beare, 1989; Condon, et al., 1989; Egan, et al., 1989). Yet, little is known about the relative benefits and drawbacks of such technology-based programs for teacher education in special education, especially with respect to their cost-effectiveness in comparison with more traditional personnel preparation programs.

It was determined to modify the existing graduate degree and certification program in Severe/Profound Handicaps at West Virginia University (a low incidence handicaps program with prospective students scattered across a wide and largely remote rural area) to make effective use of the West Virginia satellite network to improve the accessibility of training to prospective and practicing special education teachers in rural areas throughout West Virginia and surrounding region. The WVU Distance Learning Project was designed to use a distance learning model to offer a training program for teachers that develops competencies in state-of-the-art program design and delivery for individuals with severe/profound/multiple disabilities in local schools schools and other community agencies. Project staff kept data on costs of the program related to personnel and delivery costs as well as program outcomes in terms of number of trainees, in order to compare the effects of the distance education model with the programs previous models (including campus-based and field-based delivery systems). These data were compared with departmental financial and productivity records available from previous years of the Severe/Profound Handicaps program operation.

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**Program Evolution**

The Severe/Profound Handicaps Program at West Virginia University has evolved over the last 15 years to address the changing training needs of educational personnel in this very rural state. In 1978 the faculty of the Department of Special Education at West Virginia University initiated a new graduate level program leading to a Master's degree and teaching certification for service to children, adolescents, and adults with severe/profound mental retardation, physical or sensory impairments, multiple handicapping conditions, serious challenging behaviors, and/or dual diagnosis. In its first phase (1978 - 1980 followed by a program hiatus from 1980 through 1983 due to faculty turnover), this campus-based program made no accomodations for individuals employed in community settings, offering only campus-based courses and practicum experiences. All traineees were supported by tuition waivers and living stipends provided in the form of university traineeships funded by a federal grant. During this two year period, only 12 trainees completed the program.

To address university concerns about low program enrollments and a growing demand for training by personnel in outlying rural areas, the second phase of the progam employed a field-based model from 1983 - 1991. Specially trained field-based instructors working under the supervision of faculty delivered coursework at six regional sites around the state (average trainee travel time 45 to 120 minutes) through bi-weekly evening class sessions, while university supervisors provided on-the-job practicum experiences in the trainee's own job setting. Grants from the state education agency allowed all courses to be offered with tuition waivers to minimize trainee expenses. During this phase, 93 trainees completed the second phase in four two-year cycles.

As the number of trainees continued to increase and as personnel were needed in increasingly remote areas of the state, faculty implemented a distance education model in the third phase of the program in Fall 1991. Using satellite telecourses broadcast to local sites (average trainee travel time 20 to 45 minutes) and on-the-job supervision of practicum experiences, one faculty member and two doctoral level graduate assistants provide all coursework and practicum experiences to trainees in their home communities. Tuition waivers and stipend reimbursements are made available through state and federal grants to help trainees with the costs associated with participating in the program. To date, some 120 trainees are enrolled in the program; 13 trainees completed all program requirements in 1993-1994, with 25 scheduled to finish by August 1994, another 30 by August 1995, and a final group of 35 by 1996 (in overlapping three year cycles). The distance education model also allows the program to incorporate another 8-10 campus-based students pursuing full-time study; these students attend classes in the broadcast studio and complete practica in local schools and agencies.

**Description of the Severe/Profound Handicaps Program**

Structure. The Severe/Profound Handicaps Program at West Virginia University is a graduate program leading to the Master's degree in Special Education as well as West Virginia teaching certification in Severe Handicaps (nongraded) and/or qualifications for mental retardation personnel (adult services. Trainees may pursue certification only, degree only, or combined certification and degree program options in the distance education program, all without ever needing to travel to campus.

Eligibility. Trainees must meet all requirements for admission to graduate study at West Virginia University, including an undergraduate degree in any area with a Grade Point Average of 2.5 or better from an accredited institution of higher education. Prior training or experience in education or a related area, although desirable, is not necessary. Trainees who are employed on a full-time basis to provide direct service to children, adolescents, or adults with severe or multiple disabilities in school systems or other community agencies in West Virginia are eligible for tuition waivers and stipend reimbursements to cover costs associated with participating in the program. Trainees who are not currrently employed or who have positions outside the state may participate

by paying full tuition and fees. Trainee financial assistance has been made available through a combination of state and federal grants for personnel preparation.

Program Content. The program requires completion of 30 semester hours of coursework and practicum experiences for certification and an additional six hours of elective credits for the degree. The program was designed to prepare professional educators to provide state-of-the-art early intervention services in home-based, center-based, and integrated settings through collaboration with family members, professionals from other disciplines, and service agencies.
Program Courses. The eight required courses include:

SPED 327 Assessment: Developmental Handicaps
SPED 328 Instructional Programming: Developmental Handicaps
SPED 322 Characteristics and Methods: Physical Handicaps
SPED 323 Family/Professional Consultation: Developmental Handicaps
SPED 324 Communication Intervention: Developmental Handicaps
SPED 320 Curriculum: Severe Handicaps
SPED 325 Secondary/Adult Programs: Severe Handicaps
SPED 329 Managing Challenging Behaviors: Severe Handicaps

The requirements for every course include active class participation in a variety of simulation and discussion activities (e.g., writing behavioral objectives, roleplaying a parent conference, practicing test administration), completion of an applied project requiring trainees to conduct some activity related to course contact with an actual young child with a delay or disability (e.g., design, implement, and evaluate an augmentative communication program; critique a daily instructional schedule; construct an adapted material), and complete two essay exams involving application of course principles and practices to real or hypothetical cases (e.g., outline the design of a family training program; critique and rewrite curriculum goals; design of an augmentative communication system). The program relies heavily on the case method in recognition of its importance in developing skills for practical application of theory, reflective decision making, and appreciation of the sociocultural and ethical complexities of working with children and families.

Practicum Components. Each trainee completes an individualized practicum plan outlining the activities and documentation that will be used to demonstrate competencies. Trainees may submit a product for review by the supervisor (e.g., instructional material, written IFSP form, parent newsletter), submit a video- or audio-tape recording of an activity that canot be witnessed directly (e.g., home visit, assessment battery administration), arrange for the supervisor to observe an activity (e.g., small group lesson, positioning routine), or provide written documentation from another qualified observer (e.g., principal, physical therapist). The supervisor is responsible for approving the practicum plan, verifying all documentation assembled in the trainee's portfolio, rating the trainee's performance, and assigning a grade for completion of practicum requirements. Supervisors are assigned six trainees to supervise per .25 FTE time assigned to the program; to reduce travel time and costs, supervisors are responsible for trainees in geographic clusters.

**Distance Education Delivery System**

The Distance Learning Model has been designed to incorporate state-of-the-art delivery techniques recommended in the professional literature. Effective distance learning incorporates the following features: 1) use of a live teleconference delivery system with an audio bridge to allow continuous contact between instructor and students , the format most similar to traditional instruction (Garrison, 1980); 2) planned opportunities for interaction between instructor and students using discussion and activities to similar traditional classroom dynamics and promote active learning (Anderson, 1989); 3) maximum use of visual presentation methods and materials (Bates, 1987); 4) comprehensive and well-designed course support materials that present content in clear, readable language, study guides to draw attention to key points and stimulate

student critical thinking, formats designed to motivate students and promote active learning, and detailed guidelines for satisfactors performance (Keegan, 1990); 5) immediate, consistent, and informative feedback on student performance via grading of assignments and exams (Howard, 1987); and effective administrative organization and coordination to maximize student satisfaction and program completion (Rowntree, 1986). Attention to these criteria during planning and implementation ensured that the project used the distance learning model effectively to promote student knowledge and competency acquisition.

Telecourse Broadcasts. Each course is delivered as a live interactive telecourse broadcast via C-band satellite from the television studio at West Virginia University in Morgantown (northern part of the state) and relayed by microwave to the state's only C-band uplink facility in Institute (southern part of the state). Campus-based students attend class at the television studio, while all other students attend at some 30-40 public downlink sites around the state. Downlink sites generally are located at local community colleges, private colleges, and public colleges and universities, at local high schools ot vocational-technical schools, or in public libraries or other community service centers. Downlink sites must have a satellite dish, C-band capable receiver, television monitor, telephone, and seating for participants. Although sites may vary from semester to semester depending upon trainee locations, most trainees attend the same site throughout the program; the average number of trainees per site is 3-5, although a few sites occasionally attract more than 10 trainees, and a handful of trainees attend sites alone. Courses are offered at the rate of one per semester and one per summer so that trainees can complete all coursework within a three year period. Each weekly class session consists of a two-hour live broadcast from 6:00 p.m. to 8:00 p.m. with telephone linkages with the distant sites for questions, discussion, and in-class activities. The broadcast is followed by a 45 minute call-in audio segment in which distant site participants can use an #800 telephone number to contact the instructor for help with course content, assignments, or other advising concerns. The instructor and graduate assistants also are available for telephone contact throughout the week during daily office hours.

Telecourse Components. Each telecourse consists of 12-15 weekly broadcast sessions conducted by an member of the graduate faculty who engages participants in lecture, discussion, individual activities, and group activities much the same as would be found in any other graduate level course. Presentation methods include lectures; live and taped demonstrations; guest interviews with content experts, state leaders, working professionals, and family members; and commercial and instructor-developed videotapes of early intervention programs, personnel, and practices (in collaboration with local families and agencies). Interaction methods to enhance trainee participation include discussions; case studies; experiential activities such as simulations, role plays and guidedf practice. When studio class trainees interact, they appear on screen; trainees at the distant sites are heard over the phone by all participants and are identified by name and by site. Trainees purchase a course packet that contains all materials needed for the course (except for the textbook): syllabus; directions for assignments and exams; lecture notes, handouts, and activities for each class session; evaluation forms; and other information about distance learning formats and program requirements. Trainees may obtain assistance with course requirements by contacting the instructor during the post-class audio call-in segment, by telephoning the instructor or graduate course assistant during daily office hours, or by calling the assigned grader (other graduate assistants, with one per 20 - 25 trainees) at home in the evening. Every class session is planned and scripted in advance to insure smooth, effective delivery, and more complex activities may be rehearsed in the studio just prior to air time. Broadcasts are organized to reflect the highest quality distance education strategies, including planned and continual interaction between instructor and trainees, immediate and informative feedback on performance via grading of assignments and exams, organization and coordination of all program components, and modification of content and delivery methods in response to systematic trainee evaluation.

Program Cohort. To reduce the isolation of distance learning and to develop a support network for early interventionists across the state, the program includes a variety of components to facilitate

participant interaction. During the first class session of each course, all students call in to introduce themselves, describe their early intervention roles and programs, and note their status in the training program (first course, last course, half way through program). These introductions allow trainees to see the range of people and practices involved in early intervention in West Virginia, to identify others with similar jobs and needs, and to appreciate the scope and impact of the training program (trainees typically encourage beginners and applaud those who finish). During all class sessions, distant site students are involved in cooperative activities (e.g., offering teaching suggestions for a case study) and collaborative activities (e.g., role playing an interdisciplinary meeting) that require them to exchange ideas with other trainees at their own site as well as with all participants on the air. Trainees are permitted (indeed encouraged) to work cooperatively within or across sites in completing two take-home essay exams as long as every trainee writes his or her own individual answers. At the final class session, a photograph of each distant site trainee is shown and some interesting personal information is shared (e.g., one woman shows horses; a man is a local disk jockey; several people have lived in a foreign country); all trainees who have completed the program are identified and congratulated. These techniques help instructor and trainees to relate to each other as real people, to build a sense of comraderie and solidarity within the distant education program, and to establish the foundations of a personal and professional support networkfor early interventionists that will continue even after trainees finish coursework.

Practicum Experiences. Trainees are required to complete six credit hours of practicum experiences as three two-credit-hour blocks, two three-credit-hour blocks, or as one six-credit -hour block. Those who provide direct service to young children and their families in early intervention are permitted to complete practicum requirements in their job settings with the permission of the employing agency; those who work in supervisory positions or who are not employed at all are placed in appropriate early intervention programs under the supervision of qualified personnel. Trainees attend a half-day orientation session outlining practicum procedures and requirements and they purchase a practicum handbook that contains all needed information and forms. Practicum standards require trainees to demonstrate some 50 competencies in the following areas: assessment, curriculum development, program management, instructional programming,behavior management, instructional evaluation, collaboration with families and professionals, and professional responsibilities and development. Supervisors are university-based doctoral students who travel to each trainee's practicum site, making an initial orientation visit, followed by a minimum of one observation visit per credit hour, and capped off with a final exit interview. Trainee performance is documented through live observations, review of videotaped activities, survey of a portfolio containing samples of trainee products, and interviews with other agency staff. To evaluate trainees, supervisors use a rating scale with specific indicators for each competency to be judged as Strong-Adequate-Weak as well as by a written summary statement by the trainee and the supervisor.

**Program Comparison**

All program phases required trainees to complete the same 24 semester hours of required coursework (eight courses) and six hours of practicum; an additional six credit hours of electives were needed to complete requirements for the Master's degree. Cost estimates are based on dpeartmental personnel and financial records and have been adjusted for inflation, salary differences, and fee increases to allow for comparison across the 15 year time span encompassed by the three program phases.

Campus-based Program Phase. The campus-based program phase (1979-1983) required full-time study on campus for one year (two semesters plus summer sessions) and completion of a traditional practicum experience in a placement in the university community with a master educator. In this phase, the program was staffed by one instructor (faculty member) at 1.0 Faculty Time Equivalent (FTE) and one graduate assistant at .50 FTE. Courses enrolled an average of 10-15 trainees per semester and practica enrolled 5-6 trainees per semester, with 12 trainees

completing all program requirements across a two year period (average of 6 trainees per year). The low completion rate was due to low overall enrollment as well insufficient financial support to fund full-time study. The costs for this program were primarily for personnel, at approximately $40,00 per year. Delivery costs were negligible. For this campus-based program phase, the cost per course was an average of $4000 and the cost per trainee was an average $3400. The benefits of the campus-based program were: faculty expertise for instruction and supervision; minimal faculty time and effort; availability of multidisciplinary campus resources (personnel, materials, media); and support networking provided by a full-time trainee cohort. The drawbacks of this phase were: extensive funds needed to support full-time trainee study; inaccessibility of program to nontraditional trainee (employed individuals with adult job and family responsibilities, individuals living in rural areas or at a distance from the university); and minimal impact on real school and community service programs serving people with disabilities in the state.

Field-based Program Phase. The field-based program phase (1983-1991) allowed off-campus study at six regional sites for two years (four semesters plus two summer sessions) and completion of an on-the-job practicum experience in the trainee's local community supervised by travelling university personnel. In this phase, the program was staffed by one instructor (faculty member) at 1.0 Faculty Time Equivalent (FTE) and two graduate assistants at .90 FTE each, and two or three adjunct instructors at .10 FTE each. Courses enrolled an average of 20-30 trainees per semester (4 to 6 per site) and practica enrolled 15-20 trainees per semester, with 93 trainees completing all program requirements across an eight year period (average of 11.4 trainees per year). The costs for this program were primarily for personnel, at approximately $56,00 per year. Delivery costs (including travel expenses, telephone and mail communications, and materials) were $7500 per year. For this field-based program phase, the cost per course was an average of $12,700 and the cost per trainee was an average $3175. The benefits of the field-based program were: accessibility of training to individuals in rural areas; availability of training to nontraditional trainees; and provision of technical assistance to service programs in the field. The drawbacks of this phase were: inexperienced instructional personnel; extensive personnel time and effort; costs associated with travel for instruction and supervision; and limited access to campus multidisciplinary resources.

Distance Education Program Phase. The distance education program phase (1991 to present) allows off-campus study at innumerable local satellite downlink sites (average 30 sites per semester) for three years (six semesters plus two summer sessions) and completion of an on-the-job practicum experience in the trainee's local community supervised by travelling university personnel. In this phase, the program is staffed by one instructor (faculty member) at .33 Faculty Time Equivalent (FTE) and two graduate assistants at .90 FTE and .50 FTE, and two additional graders at .02 FTE each. Courses enrolled an average of 20-50 trainees per semester (4 to 6 per site) and practica enrolled 8-12 trainees per semester; 18 trainees will have completed the program by 1993-1994, with another 90 or more completing all program requirements across a five year period (average of 21.4 per year). The costs for this program were high, both for personnel, at approximately $60,000 per year, and for delivery (including telecourse production, travel expenses, telephone and mail communications, and materials) at $53,000 per year. For this distance education program phase, the cost per course was an average of $12,300 and the cost per trainees was an average $3175. The benefits of the field-based program were: instructional expertise of most qualified faculty; accessibility of training to individuals in rural areas; availability of training to nontraditional trainees; access to multidisciplinary resources of the university; development for support netwroks for rural trainees; and provision of technical assistance to service programs in the field. The drawbacks of this phase were: high production costs for satellite courses; extensive development time and effort; costs associated with travel for instruction and supervision; and limited personal contact between instructor and trainees.

Program Comparisons. An examination of the costs and outcomes across all three program phases reveals both striking similarities and differences. Although the campus-based program

had the lowest combination of per course and per trainee costs, it also produced the fewest number of trainees completing the program. During this phase, training was only available to individuals who could leave their jobs, homes, and families to attend the university on a full-time basis. Although trainees received some financial support, this amount was not sufficient to off-set the expense of foregoing a salary, relocating a residence, and other factors associated with study on campus. Consequently, few individuals from rural areas of the state were able to take advantage of this training in this delivery model. The field-based program achieved a reasonable balance between costs and outcomes, slightly increasing personnel and delivery costs but producing substantially more trainees. This phase presented several significant drawbacks, however , with less expert instructors, more personnel time and effort, , and little or no access to university resources. Although many rural educators had access to the program during this field-based phase, many others lived in areas too remote to attend courses on a regular basis. Data from the distance education program phase show a dramatic increase in costs yet a major increase in production of trainees. While the per course costs were much higher, the per student costs remained about the same. Costs are anticipated to decrease somewhat as program operation becomes more efficient in the years to come. The costs of the distance education model are more than offset by the increase in the number of trainees (with full access even in the most rural areas). And, this model maintains nearly all of the combined advantages of both other models. It is interesting to note that per student costs were nearly equal across all three program phases; apparently, the higher costs associated with technology-based delivery can be balanced out by the highre number of trainess who are able to participate.

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